



INTELLIGENT LIGHTING CONTROL SYSTEM

INNOVATIVE LIGHTING
SOLUTIONS

AVANTGARDE
DESIGN BUREAU

INTELLIGENT LIGHTING CONTROL SYSTEM «PHOENIX»

Lighting control and monitoring based on data exchange via electric wires without additional cables for data transfer, preserving all functional features of lightning system.

Intelligent lighting control applications:

- Public city lighting (highways, roads, parks, sidewalks, etc.)
- Airports, railway stations, parking lots, etc.
- Industrial sector (factories, plants, industrial area)
- Tunnels, bridges and transportation infrastructures
- Railway and other facilities requiring high-quality lighting.

Solution relevance

Rapid development of metropolises comes along with a large-scale expansion of urban infrastructures; consequently, the need for innovative solutions in the field of lighting is on the significant rise.

This system allows to dramatically reduce the energy costs and service personnel, and minimize the influence of human factor as well.



KEY FEATURES OF THE SYSTEM

Automatic lighting control (without operator, according to the preinstalled software). Automatic lighting switching on and off according to astronomical calendar (sunrise/sunset).



Lighting switching on and off according to the light sensor, and according to weather conditions (fog, smog, thunderstorm, strong wind).



Precise dimming based on the pre-set schedule, depending on the time of the day. Precise dimming of each lamp separately, in a group or in the entire line.



Isolated operation of the system (offline mode), in cases when communication with the control center is absent.



Malfunctioned lamps information displayed at control center.



Control of all lamps condition in a single control center (street, district, city, country).



Collecting information of consumed energy for any period in a single control center.



Flexible integration into other systems. Due to the use of PLC (Power Line Communication) protocol, it is possible to integrate into existing lighting system, without modifying and upgrading wiring systems.

PLC

Operator station is able to connect to the control center from anywhere in the world via internet, to receive information and control local lighting system of each district separately.



One control center can control the lighting system of the entire country.



HOW DOES IT WORK?

Power Line Communication (PLC) technology

The input side of lighting system shall be equipped with a PLC transmitter-controller, and its output side, i.e. the lamps themselves – shall be equipped with appropriate receivers. Normally, luminaires are equipped with traditional dimmable devices with a 1-10 V interface. PLC allows establishing communication between control element and dimmable lamp without installation of additional network for data exchange. Each luminaire has its own ID number.

The system maintains its operability, while the operator can regulate lighting intensity of separate group of luminaires, as well as of one single lamp within certain interval ranges.

For example, the system may increase lighting intensity during cultural events performed in a separate part of a city or town during nighttime. As an example, provide additional local lighting for cultural events in a separate part of a city or town in the evening.

Individual pattern of the pedestrian street lighting

The diagram demonstrates example pattern of lighting system operation from 21:00 p.m. to 05:10 a.m. on March 21st in Almaty city. Another pattern of system operation can be set depending on seasons and regions, and daylight length.

The red zone indicates the level of energy saving.

The red dotted line indicates twilight, when drivers experience the greatest discomfort while driving. During this period, the lighting operates at a maximum level.

Period from 21:00 to 23:00 – lighting brightness decreases, energy savings - 20%.

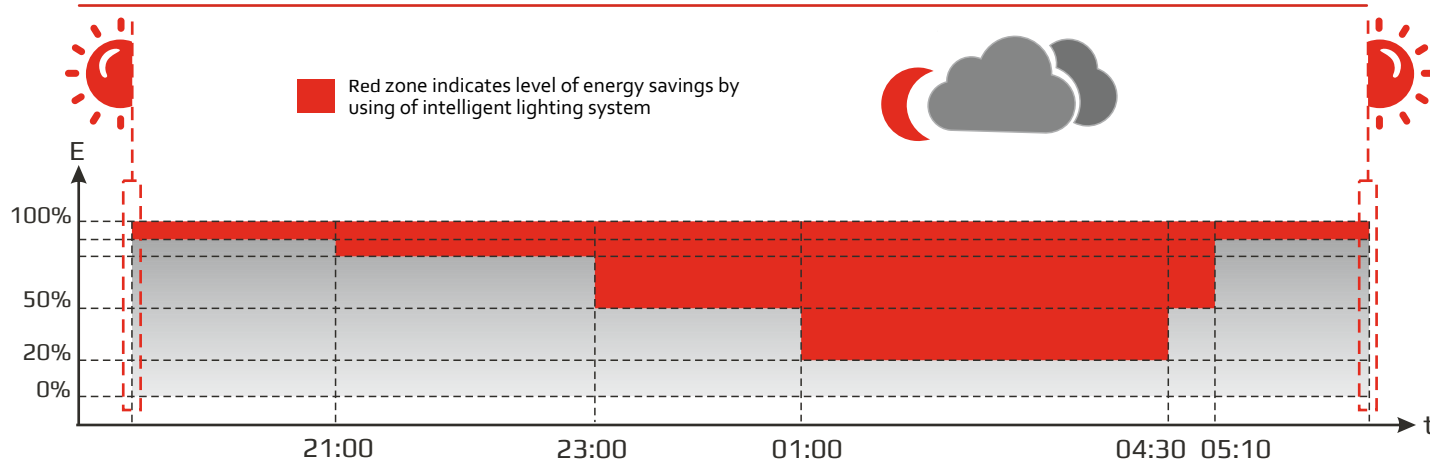
Period from 23:00 to 01:00 – lighting brightness decreases, energy savings - 50%.

Period from 01:00 to 04:30 – maximum energy savings - 80%.

Period from 04:30 to 05:10 – beginning of the astronomical dawn. The dimming system gradually increases lighting brightness up to 5:10 am; at twilight, the lighting operates at maximum brightness to prevent road traffic accidents.

Time of astronomical sunset/sunrise based on 21st of March – the spring equinox. This is an average indicator for the calendar year. Consequently, data is prepared for Almaty city. In case if system operates in another city, if the system will automatically reset according to geographical coordinates of operation region.

Pattern of operation and lighting level adjustment by using of intelligent lighting system.

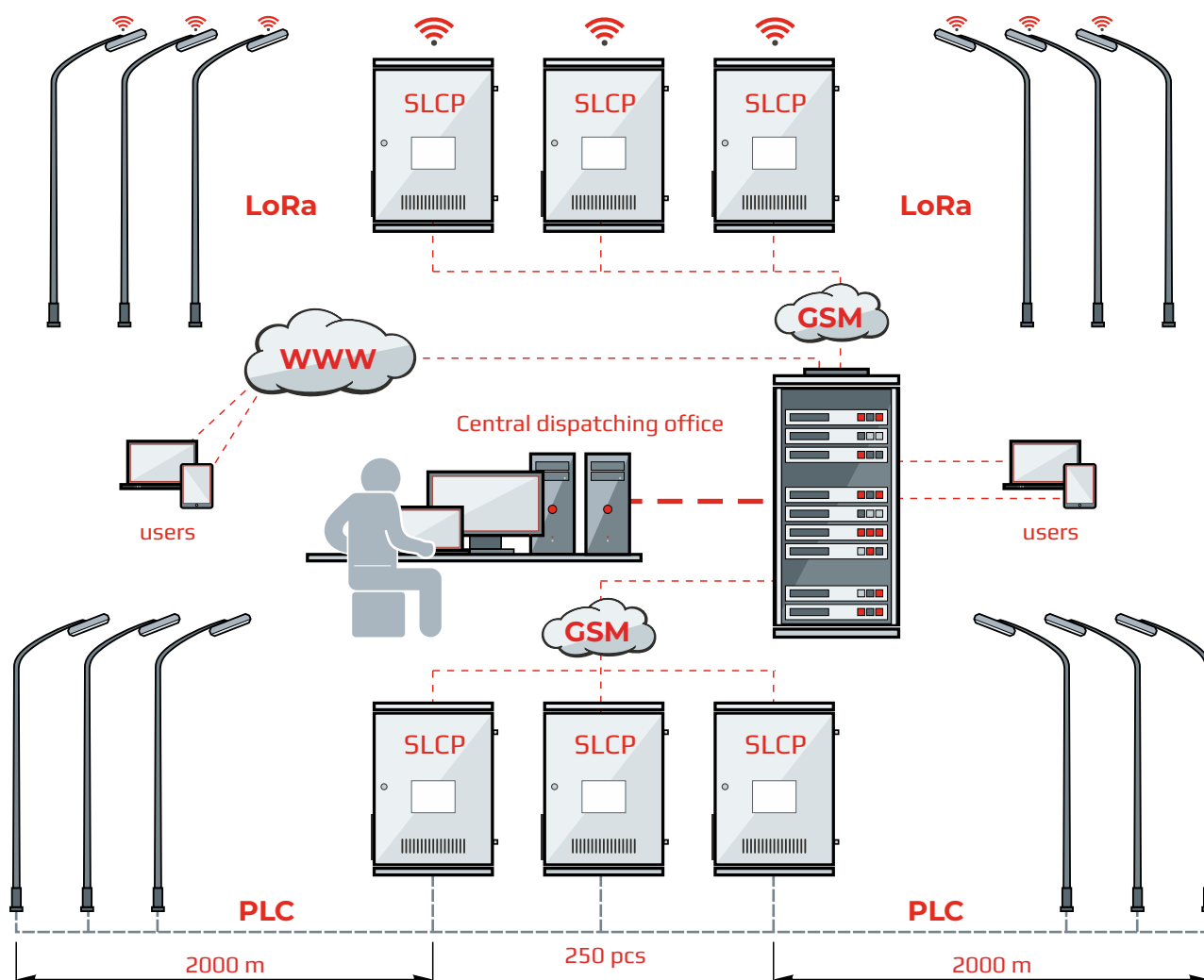


Thus, the system not merely allows to efficiently save the electricity, but also factors in the specificity of lighting depending on the time of the day, weather conditions or features of the illuminated space.

MAIN FEATURES OF PHOENIX SYSTEMS

The **PHOENIX** intelligent control system allows you to monitor and control lighting by exchanging data both over power lines and using wireless technologies, without the need for additional data cables. Lighting control can be carried out both automatically (without operator intervention, according to a pre-installed program), and in manual mode. The **PHOENIX** system is able to turn the lighting on and off according to the astronomical calendar (sunrise/sunset) programmed into the memory of the controllers, as well as change the brightness of the lamps depending on the time of day according to the set schedule. Our software allows the dispatcher to control both one specific luminaire and the lighting of an entire country anywhere in the world. In addition to the main functions listed above, the **PHOENIX** lighting control system allows you to:

- Remotely control the brightness and color temperature of street lights.
- Remotely monitor the status of equipment and fixtures in a single control center (street, district, city, country).
- Collect statistics on electricity consumption and savings, as well as on other parameters of the power grid.
- Lighting switching on and off according to the light sensor, and according to weather conditions (fog, smog, thunderstorm, strong wind).
- Isolated operation of the system (OFFLINE mode), in cases, when communication with the control center is absent.
- Notify about opening of equipment cabinets and unauthorized connections to the line.
- Notify about problems with the supply or outgoing lines.
- Control equipment temperature.



ADVANTAGES OF LED LIGHTING SOURCES

New level of color rendering in lighting – the light is brighter while the eyes are less irritated.

Lower power consumption. Diode light sources are able to operate 10-20 times longer than conventional ones.

Caring for the environment. Modern light sources, due to their operational economy, help to significantly save natural resources spent on power supply of lighting systems.

Benefits for business

Intelligent lighting system optimizes expenditure in electrical power consumption, and thus can be useful for:



agricultural sector –
greenhouses, hotbeds



construction companies – road
construction, highways and
other facilities



industrial and storage
enterprises



IMPROVEMENT OF LIFE QUALITY

Dark or poorly lighted streets, flashing, dim or non-operating lights – the situation is very familiar for citizens. The “brighter” future of our streets is inseparably associated with their quality lighting.

Sufficient lighting of roads, pedestrian footpaths and side-walks, squares and parks, creates not only a comfortable and attractive atmosphere of evening cities, towns and villages, but contributes to improving of road traffic accidents prevention and reducing of crimes.

As a result, citizens and tourists walking down the streets in the night city will become a natural component of city life.

Advantages of the «Phoenix» intelligent lighting control system

- High reliability of the equipment
- Innovative technologies application
- Compliance with the industry standards
- Operation at excessive temperature ranges from -40 to +70
- Certificate
- 5-years warranty



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